What is claimed is:

1. An active system for reducing vibrations in a rotating system, said system having a member rotating about an axis of rotation and generating vibratory loads, comprising:

a housing disposed in combination with the rotating system and defining an internal chamber;

a Magneto Rheological Fluid (MRF) disposed in said chamber, and

means for selectively distributing said MRF within said chamber for reducing said vibratory loads active in said rotating system.

2. The active system according to claim 1 further comprising:

means for driving said housing at a rotational speed greater than the rotational speed of said rotating system;

a stationary shaft disposed internally of said rotating member;

an outer fairing disposed about said housing and rotating at the same rotational speed as the rotational speed of the system; and

wherein said distribution means further comprises:

at least one electromagnet disposed in combination with said rotating housing and adjacent said housing chamber;

at least one electromagnet disposed in combination with said outer fairing and proximal to said housing chamber;

a scupper disposed in combination with said stationary inner shaft and projecting into said chamber and contiguous with said MRF such that said housing rotates relative to said scupper and facilitating distribution of said MRF within said chamber,

a power source for energizing said electromagnets to generate a electromagnetic field within said chamber;

means for controlling said electromagnets and said drive means for selectively varying the viscous properties of said MRF within said chamber.

3. The active system of claim 1 further comprising:

means for driving said housing at a rotational speed greater than the rotational speed of said rotating system;

a stationary shaft disposed internally of said rotating member;

an outer fairing disposed about said housing and rotating at the same rotational speed as the rotational speed of the system; and

wherein said distribution means further comprises:

at least two stationary electromagnets disposed in combination with said rotating housing and adjacent said housing chamber;

a scupper disposed in combination with said stationary inner shaft and projecting into said chamber and contiguous with said MRF such that said housing rotates relative to said scupper and facilitating distribution of said MRF within said chamber,

a power source for selectively energizing said stationary electromagnets to generate a electromagnetic field within said chamber; and

means for controlling said electromagnets and said drive means for selectively varying the viscous properties of said MRF within said chamber.

4. The active force generation/isolation system according to claim 1 wherein said rotating system is a helicopter rotor system, said rotor system producing NP vibrations and wherein said drive means rotates said housing at a absolute rotational speed of NP wherein P is the rotational speed of said helicopter rotor system and N is the number of blades.

5. A device for reducing vibrations in a rotating system, said system rotating about an axis of rotation and generating vibratory loads comprising:

a housing disposed in combination with the rotating system and defining an internal chamber;

a Magneto Rheological Fluid (MRF) disposed in said chamber, and

speed sensing means for sensing the rotational velocity of said rotating system and issuing speed signals indicative thereof;

drive means for driving said housing about said rotational axis;

signal processing means, responsive to said speed signals, for issuing control signals indicative of an MRF distribution within said housing; and

a means, responsive to said speed control signals, for selectively distributing said MRF within said chamber for reducing said vibratory loads active in said rotating system.

6. The device according to claim 5 wherein said rotating system is a helicopter rotor system, said rotor system producing NP vibrations, and

wherein said drive means rotates said housing in a direction and at speed relative to the rotor system to produce an absolute rotational speed of NP wherein N is the number of blades of said helicopter rotor system and P is the rotational speed of said helicopter rotor system.

7. The device according to claim 5 wherein

said speed signals are provided by an electric power generator/alternator.

8. An active force generation/isolation device for reducing vibrations in a rotating system, said system rotating about an axis of rotation and generating vibratory loads comprising:

a housing disposed in combination with the rotating system and defining an internal chamber;

a Magneto Rheological Fluid (MRF) disposed in said chamber,

means for generating variable flux electromagnetic field within said chamber for changing the viscous properties of said MRF;

means for effecting redistribution of said MRF within said chamber;

means for driving said housing about said rotational axis;

speed sensing means for sensing the rotational velocity of said rotating system and issuing speed signals indicative thereof;

vibration sensing means for sensing vibrations active in said rotating system and issuing vibration signals indicative thereof;

signal processing means, responsive to said speed and vibration signal, for issuing control signals to said flux generation, MRF redistribution and drive means to reduce said vibrations active in said rotating system.

9. The active force generation/isolation system according to claim 8 wherein said rotating system is a helicopter rotor system, said rotor system producing NP vibrations, and

wherein said drive means rotates said housing in a direction and at a speed relative to the rotor system to produce an absolute rotational speed of NP wherein N is the number of blades of said helicopter rotor system and P is the rotational speed of said helicopter rotor system.

10. The active force generation/isolation system according to claim 9 wherein said speed signals are provided by an electric power generator/alternator.

11. A method for reducing vibrations in a rotating system, the method comprising the steps of:

enclosing a medium of variable viscosity in a housing connected to the rotating system;

sensing a rotational speed of the rotating system;

issuing a control signal responsive to the rotational speed, the control signal activating a means to change the viscosity of the medium; and

redistributing the medium within the housing to reduce vibratory loads in the rotating system.